# Obesity paradox versus frailty syndrome in first-ever ischemic stroke survivors

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Dear editor,

Results of large studies, primarily conducted in North America and Europe, have inferred an association between a body mass index (BMI) ≥ 25 kg/m$^2$ and improved survival after stroke (1,2). This phenomenon, termed the 'obesity paradox', may have implications for the management of susceptible groups.

We investigated the implications of this paradox in a group of patients with first-ever ischemic stroke (FES) in Mashhad, Iran. The study cohort consisted of 360 prospectively enrolled patients [mean age: 65·9 ± 14·3 years; 174 (48·3%) females] who were followed for five-years. Patients were placed into four categories based on their admission BMI (Fig. 1). Two hundred (55·6%) patients died during the study period. Survival differed significantly across the four groups (Fig. 1). Patients with BMI ≥30 kg/m$^2$ showed higher probability of survival, compared with other groups ($P < 0·001$). Those with BMI < 20 kg/m$^2$ had the poorest survival rates but were also significantly older than patients with BMI > 20 kg/m$^2$ (mean age = 73·3 ± 16·6 years; $P = 0·002$).

Correspondence: Mahmoud Reza Azarpazhooh*, Department of Neurology, Ghaem Hospital, Taghi Abad Square, Mashhad, Iran.
E-mail: azarpazhoohmr@mums.ac.ir

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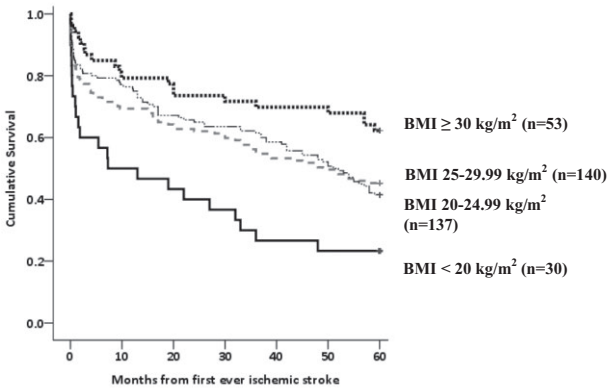


**Fig. 1** Kaplan–Meier curves of patients (all followed for five-years) within different groups of BMI at the time of admission for first-ever ischemic stroke (Log-rank tests: BMI < 20 kg/m$^2$ versus all other levels, all $P < 0·05$; no detectable differences between the other groups).

Our data suggest that in Iranian FES patients with a BMI < 20 kg/m$^2$ and who may also be at risk of the frailty syndrome, there is a compelling argument for nutritional interventions aimed at improving outcomes. Abnormally low BMI appears to be a predictor of mortality and may serve as an indicator for more proactive and systematic nutritional support in FES survivors. Whether weight reduction in survivors of FES with BMI ≥ 30 kg/m$^2$ is beneficial or harmful will need to be formally tested.

Seyyed Mohammad Reza Kazemi-Bajestani[1,2], Majid Ghayour-Mobarhan[1], Amanda G. Thrift[3], Gordon A. Ferns[4], Mohammad Taghi Frazadfard[1], Naghme Mokhber[5], Reza Behrouz[6,7], and Mahmoud Reza Azarpazhooh[1]*

[1]Cardiovascular Research Center, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
[2]Department of Oncology, Division of Palliative Care Medicine, University of Alberta, Edmonton, Alberta, Canada
[3]Department of Medicine, School of Clinical Sciences at Monash Health, Monash University, Clayton, Vic., Australia
[4]Division of Medical Education, Brighton and Sussex Medical School, University of Brighton, Brighton, UK
[5]Department of Psychiatry, Mashhad University of Medical Sciences, Mashhad, Iran
[6]Mashhad University of Medical Sciences, Mashhad, Iran
[7]London Health Science Center, London, ON, Canada

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